



Health Program

Health Project

Challenges and Strategies for Accurately Matching Patients to Their Health Data

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ABOUT BPC

Founded in 2007 by former Senate Majority Leaders Howard Baker, Tom Daschle, Bob Dole and George Mitchell, Bipartisan Policy Center (BPC) is a non-profit organization that drives principled solutions through rigorous analysis, reasoned negotiation and respectful dialogue. With projects in multiple issue areas, BPC combines politically balanced policymaking with strong, proactive advocacy and outreach.

DISCLAIMER

This issue brief is the product of the Bipartisan Policy Center's Health Project. The findings and recommendations expressed herein do not necessarily represent the views or opinions of the Bipartisan Policy Center, its founders, or its board of directors.

Introduction

The exchange of health information across care settings is a central and necessary component of coordinated, accountable, patient-centered models of care that are shown to improve quality and reduce costs. Rapidly emerging new delivery system and payment approaches with leadership by the federal government, the private sector, and the states, combined with requirements of the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs, are accelerating the need for information to flow electronically between the multiple settings in which care and services are delivered.

Enabling a clinician to view a comprehensive picture of the patient requires accurate and efficient “matching” of individual patients to their health records across settings. Currently there is a high level of variability in approaches utilized for matching, with little information available about performance—or levels of accuracy. Error rates, which average eight percent and can range up to 20 percent—can result in sub-optimal care and medical errors.^{1,2} Incorrectly matching a patient to a health record may also have privacy and security implications, such as wrongful disclosure—in addition to treatment based on another patient’s health information.³ The lack of standardization in the data attributes or fields used for matching, the information contained in those fields, and methods used, results in increased error rates as well as significant burden and cost within the health care system.

Given the foundational role that patient matching plays in electronic health information sharing, additional standards and policies are needed to support improvements in both the accuracy and execution of methods used to match patients to their health records. This will help to assure that information is available to support the requirements of coordinated, accountable, patient-centered care.

This issue brief explores some of the reasons that accurately matching patient data is so important and so challenging, and examines alternative strategies to move forward toward solutions to those challenges.

Matching Patients: An Illustration of the Challenge

Maria Garcia lives in Harris County, Texas. She regularly sees a primary care physician, an OB/GYN, an oncologist (she's a cancer survivor), a dermatologist, and a gastroenterologist. In the last five years she has received inpatient care in two different hospitals, and radiation treatments at a freestanding outpatient facility. Each of these providers created a medical record for Maria that details the care they delivered.

The problem is that each provider has only a partial view of Maria's overall health care story. The whole picture can only be seen if Maria's scattered records are connected electronically.

Luckily, technology can help accomplish this. But the challenge is more basic: How can Maria's eight different health care providers be sure they are all providing and reviewing information about the exact same patient? What means do they use to accurately identify Maria?

Consider this: In Harris County where our fictitious patient lives, there are 2,488 real patients named Maria Garcia. Two hundred thirty-one of them have the same birth date. In fact, in just that county alone, there are 69,807 pairs of patients who share both names and birth date.⁴ Extrapolate this to the entire nation, and the importance of accurate patient identification becomes starkly apparent.

Background

In January 2012, the Bipartisan Policy Center (BPC) highlighted the need to accelerate health information exchange in a comprehensive report on the critical role of information technology (IT) in health care. The report was grounded in interviews with 40 high performing organizations and developed with guidance by the BPC Task Force on Delivery System Reform and Health IT (Task Force), led by former Senate Majority Leaders Tom Daschle (D-SD) and Bill Frist (R-TN), and comprising nationally respected experts and leaders from every sector of health care.

According to the report, [Transforming Health Care: The Role of Health IT](#), "Without robust health information exchange it will be difficult, if not impossible, to develop and spread several common attributes of high performance, including those related to care coordination, clinical decision support, shared decision-making among the patient and the care team, and measurement of outcomes to support accountability and improvement."⁵ Recognizing the importance of accurately matching patients' data across settings as a key component of health information exchange, the report calls for "federal policymakers, working with industry and consumer stakeholders, to ensure the prompt development and implementation of a national strategy for improving rates of accuracy in matching patients to their health information."⁶

The BPC Health IT Initiative, through its Collaborative on Health IT and Delivery System Reform, convened meetings of leaders from more than 35 public and private sector health care organizations in December 2011 and May 2012 to explore the issues surrounding the accurate identification and matching of patient data.

As the need for information to support high quality, cost-effective care grows, so does the imperative to accurately identify patients and match their information electronically across the health care settings where they receive care. Such matching can occur electronically or through manual human intervention. Regardless of approach, failure to accurately match patient data can compromise patient safety and medical efficacy, and result in medical errors and increased costs.

Data from just one state and city suggest the potential size of this challenge: Forty percent of emergency department visits in Indiana are by patients who have medical records residing in other institutions. The Indiana Network for Patient Care, an Indianapolis-based citywide clinical informatics network that includes the city's five major hospital systems, has 12 million unique patients and 24 million unique registrations. On average, each patient has clinical data in at least two separate institutions.⁷

Currently there are no universally accepted standards for conducting matching processes or for evaluating their effectiveness. Leading health care organizations across the nation are

pursuing a number of strategies for matching patient data across settings, and their experiences bring to light various logistical, technical, and policy challenges, identified below.

Current Problems That Must Be Addressed

The fragmented nature of the U.S. health care system means that patients who receive care from more than one provider often have medical records in multiple locations including hospitals, physician practices, laboratories, pharmacies and other settings. Organizations involved in both the delivery of care and the development of systems to support care delivery, have identified multiple problems associated with the matching of patient data across the settings in which care and services are delivered, including:

1. **Significant error rates.** Two primary types of errors occur in patient matching attempts: false positives—when records are incorrectly linked—and false negatives—when records that should be linked are not.

Indranil Ganguly, vice president and chief information officer for CentraState HealthCare System in Freehold, NJ noted that “false negatives are considered the ‘lower risk’ error but can yield sub-optimal care since clinicians cannot take advantage of existing information.” He also noted that “false positives are much more difficult to correct and can cause harm by having clinicians rely on inappropriate historical information.”⁸

During BPC’s May 2012 meeting, senior vice president and chief health information officer Bill Spooner of Sharp HealthCare, a not-for-profit, integrated health care delivery system in San Diego, CA, shared his own organization’s journey towards improving the accuracy of matching. Spooner reported that between 2001 and 2012, more than 652,000 false negatives were identified within their system, which includes four acute-care hospitals, three specialty hospitals, two affiliated medical groups and a health plan. Staff were able to research and correct 568,000 of these problems, leaving more than 84,000 still pending.⁹

Published analyses of patient matching efforts report error rates of about eight percent, trending higher in high-volume patient databases.¹⁰ Ganguly shared the results of a May 2012 survey of 128 chief health information officers (CIOs) conducted by the College of Healthcare Information Executives (CHIME). Nearly half

of CIOs surveyed experienced false negative error rates of more than eight percent with a majority (41 percent) of such rates ranging from eight to 20 percent.¹¹ Approximately 40 percent experienced false positive error rates of more than eight percent, with a majority (37 percent) of such rates ranging from eight to 20 percent.¹² Moreover, 19 percent of respondents indicated that their hospital had experienced an adverse event during the past year due to a patient information mismatch.¹³

2. **Disparate methodologies.** Methodologies for identifying patients vary widely across organizations, but generally fall into two broad categories: 1) algorithms that establish identity using multiple patient attributes; and 2) unique patient identifiers, including local identifiers assigned by a health system; biometric identifiers such as fingerprint, voice, retinal or vein scans; or voluntary patient identifiers.¹⁴ The use of varied matching methods compromises the accuracy of results.
3. **Lack of agreement on or availability of data fields needed for matching.** Algorithmic approaches are highly dependent on discriminating identifiers such as name, date of birth, mother's maiden name, etc. Not all systems capture the same attributes and currently there is no widespread agreement on the set of attributes that should be used for patient matching.
4. **Variable quality of data.** A successful match requires accurate data. Data fields often hold inaccurate or outdated information as a result of unreported status changes (such as a change of name after marriage, or change of address after a move), recording errors (phonetic or typographical mistakes), and sharing of identifiers (such as social security numbers).¹⁵ In addition, the data included in these fields must be recorded in standardized ways in order for accurate patient matching to occur. According to Mark Barner, chief executive officer of Ascension Health Information Services and senior vice president and chief information officer of Ascension Health, the largest non-profit system in the U.S. operating in 1,400 locations in 21 states, "our experience has shown that matching algorithms are only as good as the data entered into the electronic master patient index."¹⁶

Currently there is not wide agreement on or adoption of standards for data fields often used to match patient data across settings.

5. **High resource intensity.** Matching patient data is currently a labor- and resource-intensive activity. Respondents to the CHIME survey indicated that anywhere from 0.5 to 20 full-time equivalents (more than three on average) are needed in their organizations to reconcile records and merge disparate or duplicative information.¹⁷ Participants in the BPC meeting cited average annual costs ranging from \$500,000 to well over \$1 million on human resources alone. According to Barner, "data management is process and resource intensive; software solutions are expensive...our larger Health Ministries have at least two dedicated FTEs to managing these processes."¹⁸

6. **Lack of transparency and limited sharing of data matching experiences.** Concerned about possible negative reactions, software and service vendors, as well as providers and health information exchange efforts, rarely share their patient matching accuracy rates. In addition, because of the proprietary nature of the industry, there is very little sharing of methods or processes associated with matching among vendors. This lack of information-sharing reduces considerably the opportunities for improvements in matching methodology and practice.

Strategies for Moving Forward

There is widespread agreement that maintaining the status quo associated with patient matching is not an acceptable option; there is too much at stake. As noted in BPC's recently released Task Force report, "to inform a national strategy on accurate patient matching, providers and vendors, working closely with patient groups and states, should collaborate with the federal government to:

- Conduct research on and share strategies, experiences, results, costs and lessons learned regarding accurate patient matching;
- Develop a common set of requirements – including principles, policies and technical specifications – that address accuracy, privacy and security needed to build trust and widespread support;
- Assess market availability of common requirements; and,
- Should no national strategy emerge in the near-term, utilize the common set of requirements for individual and group purchasing arrangements to promote standardization, reduce medical errors and risks, drive down costs, and improve care."¹⁹

Several actions were identified during BPC's May 2012 meeting, which fall into two primary areas: (1) improving the effectiveness and execution of current methods and (2) exploring the implementation of a common identifier across settings.

Improve Effectiveness and Execution of Current Methods

Current efforts to match patients and their data can be improved in a number of ways. These include:

1. **Standardize Matching Methods.** Standardizing some of the processes that are currently used to match patients is an important first step toward improving accuracy. This includes standardizing data fields, definitions and validation methods designed to improve the accuracy and the quality of the information gathered from patients. Meeting participants also agreed that identifiers and methods currently in use by health plans should be explored for lessons and guidance.
2. **Standardize Policies.** Policies that support better patient matching should be developed and adopted, including those related to the establishment of acceptable benchmarks or rates of error in matching.
3. **Share Lessons Learned and Best Practices.** Methods for sharing methods and results across organizations that are non-threatening should be developed and implemented. Best practices and lessons learned regarding technology, human resources, workflow and policy will facilitate improvement across the industry. More transparency in disclosing accuracy rates will facilitate assessment of methods and also promote improvement.
4. **Collectively Organize and Support the Adoption of Shared Services.** Common principles, policies, standards, and methods for matching patient data will facilitate the sharing of services for matching across multiple organizations, promoting standardization, improving results and producing economies of scale. Current initiatives under development by both private sector consortia and states to create shared services for patient matching should be assessed and leveraged for more widespread deployment.

One example of a collaborative shared services effort shared during the May 2012 meeting is the Care Connectivity Consortium, in which five leading health systems-- Geisinger Health System, Kaiser Permanente, Mayo Clinic, Intermountain Healthcare, and Group Health Cooperative--have joined together to pioneer the effective connectivity of electronic patient information in an approach that protects patient confidentiality.²⁰ The Consortium plans on making available shared services—including identity management services—with the goal of lowering the barriers associated with correlating patient data across organizations.²¹

Explore Feasibility and Impact of Approaches That Would Promote the Use of a Common Identifier

Discussions about developing a unique patient identifier (UPI) have been ongoing for years. Although the Health Insurance Portability and Accountability Act of 1996 (HIPAA) called for the creation of a UPI, concerns about privacy and security led Congress to pass a law in 1999 prohibiting the U.S. Department of Health and Human Services (HHS) from using any of its funds to develop a UPI without the express approval of Congress. That restriction remains in place today.²²

Under growing pressure to exchange information electronically, a number of our nation's providers are increasingly calling for a commonly accepted identifier, whether voluntary or mandatory, to improve accuracy in patient matching. Such interest is increasing due to the health information exchange requirements of rapidly emerging delivery system and payment reforms, expectations of the Medicare and Medicaid EHR Incentive Programs, concerns about patient safety, and growing costs associated with implementation of current methods.

At the same time, even UPI advocates agree that a UPI alone cannot entirely solve the various patient matching problems that currently exist. Experts point out that additional patient matching information would be required when a UPI is not known or accessible, when there are duplicate UPIs, or to accommodate historical data not tagged with the UPI.²³

There are mixed views on the public's acceptance of a mandatory unique identifier to improve the accuracy of matching of a patient's health records. As a result, numerous proposals are now emerging that would enable consumers to voluntarily sign up for a unique, common identifier that their providers could use to match their health records, with knowledge of how that identifier would be used. Such an approach could be linked with consumer-mediated methods of health information exchange (e.g. efficient, effective methods for consumers to be able to download their health records from multiple providers to support the creation of a comprehensive health record).

National dialogue—informed by research—is needed, with significant input from consumers, clinicians, health plans, hospitals and health systems, and technology companies—ideally with leadership by the federal government—to more widely assess the challenges associated with current methods and gain agreement on a common path forward to improve accuracy in patient matching. At a minimum, the following should occur:

1. **Explore the Feasibility, Viability and Expected Impact of Consumer-Directed Approaches.** A nationwide effort to develop and implement a voluntary UPI—with significant involvement of and leadership by consumers—should be explored. Common principles and policies associated with a voluntary UPI should be developed that have the support of patients, as well as the range of stakeholders involved in the delivery of health care. Methods that align with these principles and policies should be piloted in numerous markets, with the support of both the federal

government and the private sector. Lessons learned from pilot projects already underway should inform this work, such as those gleaned from the recent pilot of a voluntary UPI at Western Health Information Network in Long Beach, CA, which were shared during the May 2012 meeting.²⁴

2. **Assess the Feasibility and Impact of Implementing a UPI.** A careful assessment of the impact of a UPI on accuracy and consumer trust, as well as the cost and timeline associated with its implementation, should be conducted to inform future policymaking in this area.
3. **Assess Applicability of Current Efforts to Facilitate Identity Management Outside of Health Care.** The use of common identifiers—some of which are consumer-directed—are common in areas outside of health care. These methods should be explored and assessed for applicability and usefulness to patient matching in health care. One initiative that should be explored more fully is the National Institute of Standards and Technology’s National Strategy for Trusted Identities in Cyberspace initiative.

HHS asked the two federal advisory committees established under HITECH to study the issue of improving the accuracy of patient matching. In February 2011, the Health IT Policy Committee—the federal advisory committee charged with making recommendations related to the implementation of a “nationwide health IT infrastructure”—recommended that HHS consider the following: (1) standardized formats for demographic data fields; (2) internally evaluating matching accuracy; (3) establishing accountability; (4) developing, promoting and disseminating best practices; and (5) supporting the role of the individual/patient in identifying errors in fields used for matching.²⁵

In August 2011, the Health IT Standards Committee—the federal advisory committee charged with recommending standards, implementation specifications, and certification criteria for the electronic exchange of information—made detailed recommendations regarding (1) patient attributes that should be utilized for patient matching (the final set of which would rely upon the level of accuracy established); (2) provider and health IT developer actions designed to enable patients to verify their information and providers to identify missing attributes; (3) implementation guides for patient query patterns; and (4) policies for responses to patient queries.²⁶

In addition, HHS recently released a *Request for Information on the Nationwide Health Information Network: Conditions for Trusted Exchange* through the Federal Register that includes questions about data elements and standards that should be required for patient matching queries.²⁷ HHS has requested comments by no later than June 29, 2012.

Next Steps

As noted above, a national dialogue is needed, engaging input from health care stakeholders and the public, regarding methods for improving the accuracy of patient matching. To inform such discussions, BPC will perform a more in-depth exploration of the alternative strategies described above, which will include further input from a wide range of stakeholders including consumers, clinicians, health plans, hospitals, state leaders, and technology companies. A detailed set of findings and recommendations for strategies that will improve levels of accuracy and efficiency of patient matching will be released in a BPC report in the fall of 2012.

About the Bipartisan Policy Center's Health IT Initiative

As the only Washington, D.C.-based think tank that actively promotes bipartisanship, the BPC works to address the key challenges facing the nation, including those related to democracy, economic policy, energy, housing, national security, and health care. Established in 2007 by former Senate Majority Leaders Howard Baker, Tom Daschle, Bob Dole and George Mitchell, BPC combines politically balanced policymaking with strong, proactive advocacy and outreach. See www.bipartisanpolicy.org

As part of the BPC's Health Project which is led by Health Project co-leaders and former Senate Majority Leaders Tom Daschle (D-SD) and Bill Frist (R-TN), the BPC Health IT Initiative identifies real-world examples and best practices that facilitate coordinated, accountable, patient-centered care, and makes recommendations for ensuring that health IT efforts support delivery system and payment reforms shown to improve quality and reduce costs in health care.

One of the most recent deliverables of the BPC Health IT Initiative was the January 27, 2012 release of the report entitled, [Transforming Health Care: The Role of Health IT](#), which was grounded in interviews with 40 high-performing organizations and developed under the guidance of the BPC's Task Force on Delivery System Reform and Health IT (Task Force), led by former Senate Majority Leaders Tom Daschle (D-SD) and Bill Frist (R-TN) and comprised of nationally respected experts and leaders across every sector of health care. Key areas of focus in 2012 include engagement of stakeholders across health care in a collaborative effort focused on accelerating the adoption of the Task Force's January 2012 recommendations, including those that accelerate: (1) alignment of incentives with health IT-enabled, high quality, cost-effective care; (2) health information exchange to support coordinated, accountable, patient-centered models of care; and (3) expanded engagement of consumers using electronic tools to support improvements in health and health care.

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CentraStateHealth System	Siemens Healthcare
Cerner Corporation	St. Claire Regional Medical Center
CHIME	Texas Health and Human Services Commission
Dossia	United Health Group
e-MDs, Inc.	WellPoint
GE Healthcare	
Geisinger Health System	

Endnotes

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